Problem 1.
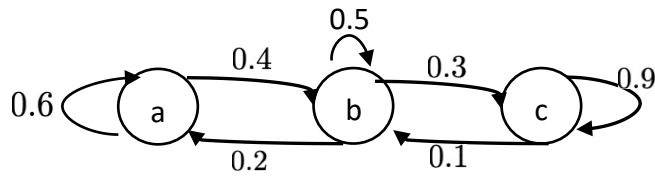
Consider a random variable X whose pdf is:

$$P_X(x) = \begin{cases} 1/2 & x = -1 \\ 1/4 & x = 0 \\ 1/4 & x = 1 \end{cases}$$

a) Find E[X] and E[X^2]

b) Find Var[X] and σ

Problem 2.

Consider a Markov chain $\{x_n, n = 0, 1, ...\}$ with transition diagram:

a) Compute the transition matrix, given x={a,b,c}

b) Compute $p(x_k = b|x_{k-1} = a)$ and $p(x_k = b|x_{k-2} = a)$